

Organic Saffron in Iran: Prospects and Challenges

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Abstract

Saffron is an economic crop of low input agricultural systems of South Khorasan in Iran. In terms of economic productivity this crop is one of the most efficient water saving crops in the world. Basically, evolution of farming practices for saffron has been based on an "Organic" system of production. Saffron growers in most parts of Iran have so far used no agrochemical input for production and most of the inputs used were internal. Agronomic practices such as application of organic fertilizers, non-chemical methods for pests and weed control, complete family labor work for production and processing, share-cropping and socio-cultural environment surrounding the whole process of saffron is in compliance with organic farming principles. In other words, Iranian saffron is mostly based on an organic production, but this system of production is in fact "organic by neglect" and is not recognized by the present system of international certification, therefore, an Internal Control System (ICS), which was proposed by IFOAM for the first time in 1996, is appropriate for organic saffron in Iran. This type of control which is based on group certification is cost effective and has been suggested for small producers. In this method, smallholders are organized into a single group with an internal support structure and a de facto inspection system.

INTRODUCTION

Increasing dependence on off-farm inputs including, fertilizers, pesticides and energy for food and fibre production is of questionable sustainability resulting in environmental degradation. Organic agriculture addresses these public demands, and has the potential to improve the agricultural system's biological functionality and to diminish some environmental pollution aspects of agricultural productions (Boer, 2003; Dabbert, 2003). Therefore, the ecological, environmental and food safety benefits of organic farming systems together with the fact of increasing consumer demand for organic food in many countries, shows that organic systems can be an appropriate alternative to conventional farming systems (Poudel et al., 2002). In many countries, organic agriculture has been adapted to local conditions, both social and agronomical, to produce viable sustainable strategies (Kristiansen et al., 2006).

Saffron (*Crocus sativus*) is the most expensive spice in the world. It is predominantly used to give colour, flavour and aroma to food, and specific chemical constituents have been identified (Koocheki, 2004). Saffron is not only a colouring agent, and an aromatic spice, but it also has very beneficial therapeutic value. Crocin is responsible for the color of saffron, whereas picrocrocin and safranal are responsible for its bitter taste and aroma (Leung, 1980). Saffron is used locally and has a traditional medicinal use (Koocheki, 2004). Recently, using of saffron in medicinal industry as a cancer curing agent has brought more attention to this crop (Abdullaev, 2002). This crop has a long history of use in the Mediterranean region in traditional fish and chicken dishes and to color and flavor rice dishes, cheese and bread (Palmer, 1990). There is also growing trend of using saffron in food industry of new products such as saffron dessert, creams, batter, beverage powders, cake mix, different semi-ready to use saffron soups and

different saffron spice mixtures.

The increasing varieties of saffron products on the one hand and the great concern about the types of substances used in our food on the other hand attract more attention towards "saffron organic production systems". Many want to be assured that the products that they are consuming do not have substances, which contain pesticides and chemical additives.

ORGANIC AGRICULTURE

Many people share a common misconception that prior to World War II all of agriculture was more or less "organic" (Mergentime, 1994). Though it is also believed that the guidelines for organic agriculture were developed in 1924 by a private association to formalise an alternative production system to conventional production (Hovi et al., 2003). The Codex Alimentarius Commission, the international food standard body established by the Food and Agriculture Organisation of the United Nations (FAO) and the World Health Organisation (WHO), describes organic agriculture in great details: "Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system." (Sligh and Christman, 2003). Organic farming can be defined as a method of production, which puts the highest emphasis on environmental protection and diminish environmental pollution of agricultural production (Liebhardt, 2003). For products to be labelled as organic, they must currently be certified by a third-party organization as having been produced according to specific standards. Today the basic standards of the International Federation of Organic Farming Movements (IFOAM) are applied worldwide, with minor differences in interpretation in different countries. In practice, this is obtained by excluding the use of most synthetically manufactured fertilizers, pesticides, growth regulators, livestock feed additives and food additives. They rely upon crop rotations, crop residues, animal manures, legumes, green manures, organic fertilizers, mechanical cultivation, mineral-bearing rocks, and aspects of biological pest control to maintain soil nutrients and productivity, and to control pests, diseases and weeds without or less disturbing environment and sustainability. More farmers also now discovered that organic production is often a legitimate and economically viable alternative enterprise (Creamer, 2003; Pardo, 2003). More than 26 million hectares (11.3 in Oceania, 6.3 in Europe, 6.2 in Latin America, 1.4 North America, 0.7 Asia and 0.4 in Africa) of cultivated land are certified as organic farms worldwide and the global market value of organic goods in 2003 was US\$ 25 billion per year (Willer and Yusefi, 2005). This is a significant amount, but organic farming is a small segment of agriculture in all countries. Organic agriculture is practised in almost all countries of the world, and its share of agricultural land is increasing everywhere. Organic agriculture is the most dynamic sector within the whole countries and has grown at a rate of more than 20% per year for the last eight years (Creamer, 2003).

Receptivity acceptance of the organic agriculture concept is growing worldwide, in both local markets and by governments (Fig. 1). In Asia, consumer demand for organic products is gradually increasing due to concern about the environmental and the potential health implications of conventional agriculture. Eighty three certification bodies (65 in Japan) have been identified as operating organic standards in Asia. Out of the 29 International Federation of Organic Farming Movements (IFOAM) accreditation certification bodies, only three are Asian, i.e. ACT (Thailand), JONA (Japan) and OFDC (China) (Willer and Yusefi, 2004). Organic farming based on the standards of IFOAM is still rare, and there is no single certifying body at a national level in Iran. However, there is a growing tendency in Iran towards internal use of organic products and also for exports.

ORGANIC SAFFRON IN THE WORLD

There are many consumers around the world that are concerned about the health risks of synthetic pesticides, food additives, preservative substances, synthetic food colouring and veterinary medicines. They find the possible health risks unacceptable, especially since the presence of organic products. Saffron products have not been excluded and however, there is a small amount of saffron that is certified organically, but this will be much more of attention in the future. Saffron is not an easy product to grow, and to grow organically produces an even bigger challenge. Agronomic practices such as using organic fertilizers, non-chemical methods for pests and weed control, complete labour work for production and processing and socio-cultural environment surrounding the whole process of saffron in most countries and especially in Iran could be regarded "Organic" and or "ignored organic". In some countries, organic saffron and its products are now available in the markets. Other saffron products such as colour cosmetics and luscious lip products are also considered as high quality products and very popular. The organic saffron is now exported in all of the European Union's countries, Japan, Switzerland, USA, Arabic countries, Australia and elsewhere. The American Saffron is certified organic and has certified through the Oregon Tilth Certification and is fully accredited with the USDA National Organic Program (Fig. 2).

SAFFRON PRODUCTION SYSTEM IN IRAN

Iran is the second largest country in the Middle East, with an area of 1.65 million km². It has been a centre for the evolution of agriculture, people engaged in agriculture first settled here some 10,000 years ago (Flanner, 1962). Different types of farming systems and land tenure can be found throughout the country, from commercial to subsistence farms, and both governmental and non-governmental organizations (NGOs) are actively involved in the agricultural sector. Farmers have managed their traditional agro-ecosystems for centuries by focusing on sustaining long-term yields rather than maximizing yields in the short term. Formerly, farmers relied on locally available natural resources to maintain soil fertility and to combat pests and diseases. The farming systems evolved common principles and processes, such as holistic utilization of natural resources, optimal use of local resources with low external inputs, consideration of genetic and physical diversity, protection and conservation of soil, risk minimization and local site-specific techniques (Koocheki and Ghorbani, 2005).

Iran is the main producer of saffron worldwide and almost more than 80% of the world saffron is produced (more than 200 t) on about 60,000 hectares in this country (Kafi et al., 2006). In addition to export issues, saffron has strong ties with social, economic and cultural values of the communities involved. Production, processing, trade and consumption of this delicate spice have evolved within the context of indigenous knowledge and from ecological points of view this crop has occupied a specific niche where no other crop can be as environmentally friendly, economically feasible and socially justified in the saffron growing areas; therefore, it is a crop of sustainable values. Bed preparation and cultivations are all carried out by labor or very simple machines. Saffron corms for planting in new fields are provided locally. Saffron soil fertility management is mostly based on cow manure composts. Other organic fertilizers such as sheep and chicken manures might occasionally be used. Some farmers keep their sheep in their saffron fields during late spring and summer in order to improve soil fertility and control weeds. Saffron does not have many pests or diseases. The main problems in saffron fields are mice, rodents and weeds. Farmers mostly use non-chemical methods such as biological control, mechanical traps, smothering and streaming, flooding irrigation and chilled water during winter irrigations. Cover and smoother crops as mixed or inter cropping systems and also sheep grazing are applied for weed management. Saffron is a family based crop and most of farming practices and particularly picking flower and separating the stigma are carried out by family members or community cooperation.

NEGLECTED FARMERS AND OPPORTUNITIES FOR ORGANIC SAFFRON PRODUCTION IN IRAN

Saffron production in Iran is highly ecological towards organic farming both in terms of technology and social issues. Agronomic practices, share cropping and socio-cultural environment surrounding the whole process of saffron operate on the basis of ecological principles. Using animal manure, wastes and by-products for soil improvement; mechanical and non-chemical strategies for controlling plant pests and weeds; diversified crops and animals in an integrative rotation; community cooperation, family labor and local market orientation in saffron could all be regarded as organic (Koocheki, 2004). However, such products of saffron cannot be recognized as organic in international markets due to the strict certification process required for organic products and therefore, they could be considered "Organic by neglect".

According to organic standards and IFOAM rules, each farmer has to be inspected annually. In developing countries, where many farmers cultivate small plots of land, such a system is unpractical and/or expensive. Therefore, group certification based on Internal Control System (ICS) with assigned staff and responsibilities practiced in most developing countries. The grower groups may range from less than a hundred to several thousands small-scale producers who coordinate marketing and thus simplify the control of product flow. Group certification which was proposed by IFOAM, require annual internal inspections of all operators, as well as an annual inspection of the group by an external inspection body (Gehlot, 2005). Group certification would possibly be appropriate for saffron growers in Iran. This type of certification which is cost effective is suggestible for such small saffron producers.

However, the long term and stable strategy to produce organic products in Iran is holding approved national standards and accredited certifying companies in charge. The basic standards of the International Federation of Organic Farming Movements (IFOAM) are applied in more or less the same way in different countries. Proper national organic standards, rules and regulations based on basic standards formulated by IFOAM should be carefully justified for organic growers in Iran. Establishing of national and local certifying organizations with affordable services for inspection, certification and improving facilities are necessary for organic growers of Iran.

CONCLUSIONS

There is a growing concern and demand for healthy food on behalf of both policy makers and the public. The demand for national and international organic food sources is a driving force requiring further consideration in all countries. Traditional saffron production systems which, in both technical and social terms are forms of ecological production are still operated in many parts of Iran. A return to more sustainable production systems in a country like Iran with a long history of ecological agriculture could be one effective method to protect the fragile local environments. Trends are emerging for production of organic herbs, spices, dried fruits and nuts for export. To comply with this demand, international regulations must be considered and proper national standards for organic agriculture should be implemented.

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Figures

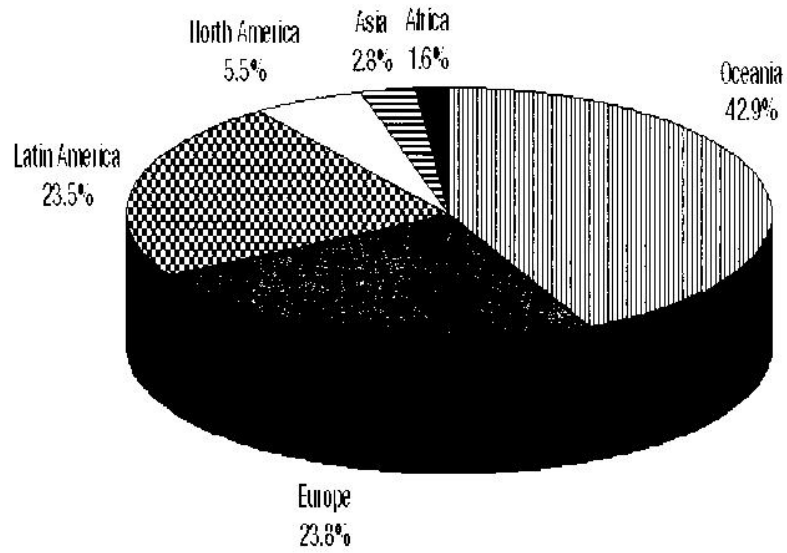


Fig. 1. Proportion of land area under organic management in different continents (SOEL, 2005).

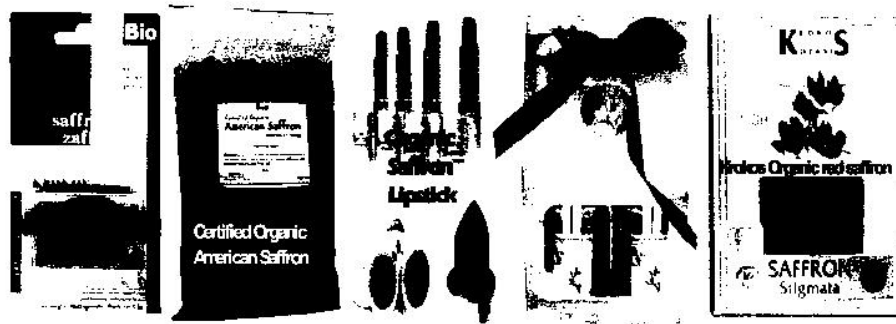


Fig. 2. Organic saffron products available in the markets.

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1. Saffron field. Photograph by courtesy of A. Koocheki.
2. Saffron rows. Photograph by courtesy of A. Koocheki.
3. Saffron flower petals-stigmata. Photograph by courtesy of A. Koocheki.
4. Saffron flower petals-stigmata. Photograph by courtesy of A. Koocheki.
5. Saffron bed.
6. Crocus stigmata.